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September 20, 1995

Dennis Shapiro
24 Essex Rd
Chestnut Hill, MA 02167

Dear Mr. Shapiro:

It was nice talking to you on the phone. As we discussed, I am sending you information about Project RE-SEED. I would also like to emphasize a few points that I believe are critical in understanding the need for RE-SEED and the impact the program has made so far (these points are also highlighted in a two-page print out I am enclosing).

The program began in 1991 with six retired engineers. To date over 180 volunteers have been trained in four New England states (Massachusetts, New Hampshire, Maine, Rhode Island). The volunteers--or Science Resource Agents (SRAs)--attend twelve whole day workshops that familiarize them with physical science activities appropriate for middle school. The activities can be conducted with inexpensive household materials, making the program accessible to all school systems regardless of the community's resources.

As the SRAs complete their training, we place them in schools. We ask that the SRAs commit to volunteering one day each week for one academic year. We have been pleased, however, to find out that quite a few of the SRAs spend more than a day per week in schools and typically 85% of them volunteer for more than one year. RE-SEED has thirteen training sites in New England, so we have been able to reach students in many communities. We recognize the importance of reaching students in lower-income areas and have made an effort to place SRAs in schools in many urban areas. In Massachusetts, we have RE-SEED volunteers in schools in Boston, Brockton, Lowell, Springfield, and Worcester.

The level and diversity of the contributions that many SRAs make have surpassed our expectations. They assist teachers with activity-based learning by sharing their scientific expertise with them and by lending a hand making it possible to do more activities. Besides this, many SRAs have built science equipment for their schools; in fact, one SRA is building a laboratory in the basement of his school. Also, SRAs help students realize how science and mathematics are connected to the "real world." And finally, the SRAs demonstrate to the students that careers in science and mathematics are both exciting, attainable and rewarding.

We would like to see RE-SEED grow into a national program. We were pleased with the response we had from recent national publicity about our programs (AARP Bulletin, March, 1995 and Electronic Engineering Times, March 6, 1995).

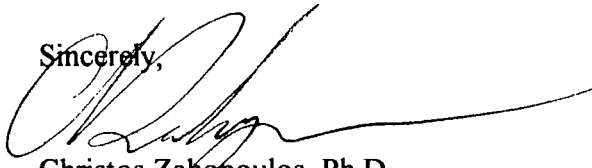
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Mr. Shapiro
Page 2
September 20, 1995

Over twenty inquiries in seventeen states¹ were generated by these two articles. Many people interested were from State Education Departments, academic institutions, and industry, organizations that have the infrastructure to run a program like RE-SEED. We hope that we can expand to some or all of these States in the foreseeable future. This year, some of our volunteers have agreed to help us approach industry to gain financial support for our program.

Based on our conversation I think that we have common goals. I hope that your effort succeeds and I am looking forward to working with you in the future. Thank you again for your interest in our program and if you have any further questions, please call me at 617.373.4583.

Sincerely,



Christos Zahopoulos, Ph.D.
Director, Project RE-SEED

¹California, Colorado, Connecticut, Florida, Indiana, Illinois, Massachusetts, Michigan, Missouri, Nebraska, New Jersey, New York, Oregon, Pennsylvania, Texas, Virginia, and Wisconsin were the seventeen states that inquired about RE-SEED.

FACTS ABOUT RE-SEED

- 1 RE-SEED is an acronym for Retirees Enhancing Science Education through Experiments and Demonstrations. It trains mainly retired scientists and engineers to be volunteer Science Resource Agents (SRAs), assisting middle school science teachers with activity-based teaching.
- 2 The program started with six retired volunteers in 1991 with support from the National Science Foundation. It grew out of Project SEED, an activity/inquiry-based, integrated Physical Science/Mathematics Teacher Enhancement Program for middle school science teachers.
- 3 The volunteers have to attend twelve whole day workshops that familiarize them with science material (activities, demonstrations, and experiments) appropriate for middle school. This training is essential before any volunteer is placed in a school setting.
- 4 In 1993 a residential Leadership Training component was added to the program. Retirees were trained to give workshops to other retirees who in turn volunteered in schools assisting science teachers. This part of the program has been supported by the Noyce Foundation.
- 5 As a result of the Leadership Training component, we presently have 13 active sites (seven in Massachusetts, three in Maine, two in New Hampshire, one in Rhode Island).
- 6 Since the program began, over 180 retired scientists and engineers have been trained in four New England states (Massachusetts, Maine, New Hampshire, Rhode Island).
- 7 The SRAs are expected to volunteer for one day each week for one academic year. Our experience has shown that most volunteer more than one day each week and about 85% volunteer for at least one more academic year.
- 8 The SRAs contributions have exceeded our expectations. They serve in many more capacities than we initially envisioned. These are some of their contributions:
 - a. Assisting teachers with activity-based learning
 - b. Making and bringing science equipment to schools
 - c. Sharing their experience as people who have worked in the field of science all of their lives
 - d. Mentoring students
 - e. Assisting students with science projects and science fairs
 - f. Bringing a wealth of knowledge and experience to the classroom
 - g. Help make scientific principles relevant to life experience

- 9 The SRAs receive tremendous personal satisfaction because of the students and teachers appreciation of them. A few of them have been recognized by their schools, their communities, and even by their town officials. Numerous articles have been written about them.
- 10 Working scientists and engineers from the Portsmouth Naval Base have joined our program and are making significant contributions in their communities.
- 11 Our Second Annual RE-SEED Conference will be held on Thursday, October 12 at Northeastern University in Boston. This conference brings together all of our RE-SEED volunteers. This year Former State Representative and Education Committee Chair, Mark Roosevelt, will address the group, as will Jack Rennie, Chair of the Massachusetts Business Alliance for Education.

CLINTON FELLOWS

L. Dennis Shapiro, September 21, 1995

Can the White House
have a program such
as Northeastern University
and call them
Presidential
Fellows?

Questions and Answers:

Q. How does one know that people in this age can be productive in this role?

A. The experiences gained by Project Re-Seed at Northeastern University have shown success.

Q. Can one expect Industry to support a Clinton Fellow program?

A. Experience gained at Project Re-Seed as well as from school-business partnerships across the country have shown that industry will provide people and other resources to improve the quality of education. Having a Presidential title will enhance their levels of interest.

Q. With so many eligible people, how does one keep the program very special?

A. Limit Fellows to a fixed number, perhaps 1,000 per year, spread across all 50 states. Have businesses and institutions compete for assignment slots each year.

Q. Why would a person want to be a Clinton Fellow?

A. Firstly, it would enable him or her to do something significant for the next ten years, or more, of their life. Additionally, being selected as a Clinton Fellow will be an important personal achievement. He/she would meet the President in Washington and receive a Diploma. His/her company would provide a special retirement package.

Q. There is a need for a large number of people to be mentors in schools. 1,000, even 10,000 is not enough?

A. The mission of the Clinton Fellows in addition to being mentors would be to help recruit and train other retiree volunteers to carry the movement forward.

Q. How would one manage a Clinton Fellow Program?

A. Build on an existing program that is devoted to training retirees with math or science careers to be mentors, such as Re-Seed. Have it clone itself at centers across the country.

Q. What about funding?

A. Some seed money would be needed after which organizations that sponsor Clinton Fellows would be charged tuition. Program would be self-sustaining.

More power to the people?

Freedom from the feds tops political wish list

BY SUSAN L. CROWLEY AND LEAH K. GLASHEEN

Heads up, America!

Get ready for what could be the most far-reaching change in your government since

the New Deal.

Instead of social "safety net" programs originating in Washington, your community, your town, your state could design and run the programs that protect needy Americans, including the poor and frail elderly.

Proponents of such a plan may differ about details, but essentially they would dismantle up to 336 federal benefit programs and funnel smaller amounts of money directly to

states as block grants, with far fewer federal guidelines.

Moreover, they would stop aid to the needy when budgets run dry, rather than guarantee help as a basic entitlement.

"The current system [of caring for vulnerable populations] is failing—America is being destroyed," says Speaker of the House Newt Gingrich, R-Ga., who advocates "re-

continued on page 14

Council vows to back key programs

BY ELLIOT CARLSON

With Medicare and Medicaid facing possible budgetary cutbacks and Social Security a potential target, AARP's chief advisory body on legislative policy strongly reaffirmed its support for these crucial programs.



Two views: Council speakers included Sen. Nancy Kassebaum, R-Kan., and Vice President Al Gore (D).



The three programs, along with "many other entitlement programs, are basic necessities for low-income elderly," AARP President Eugene Lehrmann told AARP's National Legislative Council (NLC), holding its annual meeting in Washington.

"We can't abandon these people who depend completely on Social Security, Medicare and other entitlement programs," Lehrmann said.

And with a showdown vote nearing in the

continued on page 7

INSIDE

2



MEDICARE 'TOO ARBITRARY' ON CLAIMS?

10

DREAM TAKES CLIMBER ATOP ANTARCTIC NAMESAKE

20

RETIREE GOES BACK TO SCHOOL

TREND LINE UNMISTAKABLE

Scientists probing age/cancer link

BY PEGGY EASTMAN

The number of Americans getting cancer is rising, and older people are bearing the largest share of that rise.

"Not all older persons become afflicted with cancer, but they are more vulnerable,"

says Rosemary Yancik, assistant director for applied research at the National Institute on Aging (NIA).

Yet, while older persons are the most at risk of all age groups, they are often the least likely to seek screening tests and get early lifesaving treatment for cancer, according to

research studies.

Today, when doctors detect cancer early, people of any age have a much better chance of survival. In the early 1900s, few cancer patients had any hope of long-term survival, reports the American Cancer Society (ACS).

continued on page 12

RESEED brings physics to life

Retired scientists and engineers find their second calling in middle school

BY ILENE SPRINGER

Bill Wisnawski of Westford, Mass., was captivated as he watched a ball accelerate down an inclined plane. His teacher was demonstrating Newton's second law of motion and even though Wisnawski knew quite a bit about the subject, this was no ordinary demonstration and Wisnawski is no ordinary physics student.

A 70-year-old engineer retired from Raytheon, Wisnawski went back to the classroom to learn how to perform a variety of experiments designed to help middle school students understand the principles of physics.

He is one of over 100 retired scientists and engineers who volunteer their expertise as part of the RESEED Program (Retirees Enhancing Science Education through Experiments and Demonstrations), started by Northeastern University in 1991. Funded by the Noyce Foundation and the National Science Foundation, RESEED sends science resource agents (SRAs) like Wisnawski into classrooms throughout New England at least one day a week for a year to give middle school students—and their teachers—hands-on experience with physics.

The volunteers are recruited from numerous companies, including Raytheon, Texas Instrument, ITEK Optical, Textron Corp., Monsanto and GTE. And at least two other universities—the University of Massachusetts and Worcester Polytechnic Institute—have also sent volunteers.

But before they enter the classroom each year as SRAs, the volunteers are required to spend one day a week in a 12-week workshop learning to demonstrate the properties of everything from sound and motion to optics.

"The [training] course was fascinating," says Wisnawski, who is in his third year working with 400 sixth and eighth graders at the Groton Dunstable Middle School. "It stirred in me a desire to get more involved and bring these things back into the classroom."

He recalls one of his most satisfying experiments with the kids, showing how a hydraulic system works. He had their 6-foot-3-inch, 195-pound teacher lie down on a transparent bag to which four nozzles were attached.

"I picked the four smallest kids in the class to blow into those nozzles," says Wisnawski. "When their teacher rose off the table, the kids went 'Wow!' And the teacher himself was shocked to go up in the air."



"I learned to ask a question that gets them thinking and then work through finding an answer with them," says volunteer Ken Barton (center).

It's demonstrations like these that make learning and teaching science thrilling, says Rosemary Brandi, a teacher with whom Wisnawski has regularly worked. "He's an absolute wonder," she says. "Chock full of enthusiasm for life. He represents what it

'I think he's like the wise grandfather a lot of kids wish they had.'

ROSEMARY BRANDI

means to be a lifelong learner. He brings all that wonderful experience to the kids. And you know," she adds, "I think he's like the wise grandfather a lot of kids wish they had."

But the RESEED training doesn't

simply teach the volunteers to do demonstrations. Having spent their careers in industry, many of the volunteers are not immediately comfortable in their new roles. "I learned to ask a question that gets [the students] thinking and then work through finding an answer with them," says retired engineer Ken Barton of Sharon, Mass., now in his second year with RESEED.

In addition, the training gives the volunteers and their RESEED teachers an opportunity for intellectual exchange that they both find rewarding. "We were retirees who had, collectively, lots of experience in the outside world," says Barton. "We weren't afraid to challenge [the workshop] teachers, but they took it very well."

"They seem to enjoy the comradeship and intellectual stimulation," says Alan Cromer, professor of physics at

Northeastern and co-teacher of the workshop. "It's extremely gratifying for me to work with them. Even with a simple topic, they understand the importance—and they're so motivated."

"In fact," Cromer admits, "I've gotten spoiled. I don't know if I want to go back to teaching 18-year-olds again."

To expand beyond the Boston area, RESEED started a leadership program in 1994 to train retirees to teach other retirees.

"The leadership program was a three-week, full-time program," says RESEED's director, Christos Zahopoulos. "Some people traveled to it and we paid their room and board. We've trained 14 leaders who have, in turn, trained 45 other retirees" throughout New England.

Zahopoulos hopes to eventually expand the program nationally and to re-

continued on page 16

16 RESEED

continued from page 20
cruit more women.

Shirley Frawley, 53, of Lexington, Mass., a former high school chemistry teacher who currently works part time as a technical writer, participates in the leadership program. "The retirees are a very excited and devoted group. I review physics with them and then train them to explain the concepts so a kid can understand."

The impact on students, everyone agrees, has been significant.

"I've seen kids' smiles like you wouldn't believe," says Bill Anderson, 64, of Burlington, Mass. "That's why I do it." Anderson volunteers in two different schools—in the Wilmington public school system and at the St. Augustine School in Andover, Mass. An engineer retired from ITEK since 1990, Anderson teaches 46 classes a month. He had never been in the classroom before as an instructor.

"I never knew I could teach—I love it. What I bring," he says, "is my experience in the business. The teachers and the students appreciate it. I show them this is how science works in the industry; this is how they'll use it," he explains.

His best moment came when one of the students' mothers walked in before

class and complained that her son had refused to leave school early on that day for a weekend on Cape Cod because it was his science day.

"Just what are you teaching here?" the mother asked me. I just melted," says Anderson. "I invited her to stay for class with her son and she did. I was thrilled."

Anderson isn't the only RESEED volunteer who wins rave reviews, according to Zahopoulos. On a questionnaire given to 135 students, he says, over 90 percent reported that they learned a lot from the retirees, felt comfortable asking questions and wanted to continue instruction with RESEED volunteers.

Meredith Plourde, now an eighth grader at Groton Dunstable Middle School, has fond memories of volunteer Bill Wisnawski when she had him as an SRA in science two years ago.

"He wore a costume when we were studying metalworking in medieval times," says Plourde, whose letter about the programs was published in *The Boston Globe*. "It was more fun learning from him because he passed his enthusiasm along to the kids. We enjoyed learning; it was pretty cool."

"Many of the volunteers are treated like celebrities by the students," says program co-developer Alan Cromer. "Some retirees have built equipment that stays in the classroom."



Project RESEED Director Christos Zahopoulos, center, conducts a physics demonstration during a volunteer workshop with retirees Bill Tansey and Anna Bailey.

And the benefits of volunteering work both ways. Says Bill Anderson, "We can sit and watch TV and get old—or we can go teach school and give back something to science."

For information on starting a RESEED program, contact RESEED,

Northeastern University Center for Electromagnetics Research, 235 Forsyth Bldg., Boston, Mass. 02115. Or call Deirdre Murphy at (617) 373-8388.

Ilene Springer is a Brookline, Mass., freelance writer.

Volunteers making science more meaningful

By Stephanie Maughan
SPECIAL TO THE GLOBE

WILMINGTON — Bill Anderson, a retired electrical engineer, surprised everyone in a sixth-grade science class at Wilmington North Middle School recently by calculating — correctly — that the pressure one of the girls exerted on the floor was greater than that exerted by one of her huskier male classmates.

Then, using a bottle with holes punched in it at various depths, Anderson demonstrated Pascal's law, that pressure is the same at all points at the same depth and that it increases with depth. After this, he showed the impact atmospheric pressure can have on a soda can by boiling water in it, then sealing it and watching it collapse as the steam inside it condenses.

Everyone cheered as he got a piece of cardboard to stay attached to a glass filled with water as it was turned upside down.

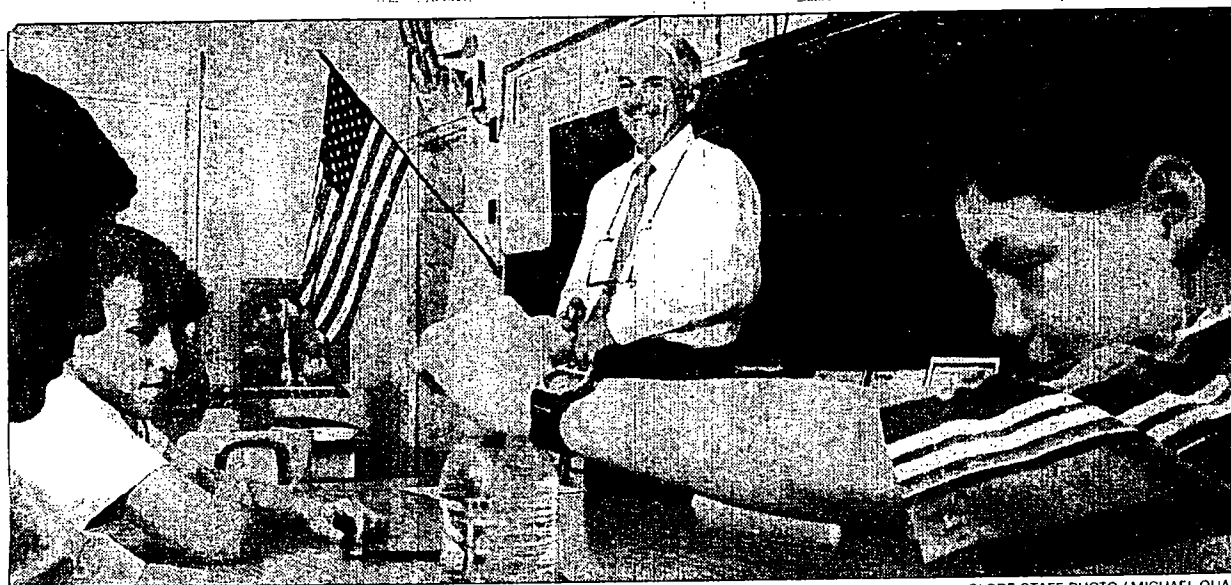
Anderson is part of Project RE-SEED, a program started in 1991 by Northeastern University and funded with \$140,000 this year from the Noyce Foundation. He is one of 65 retired scientists and engineers who

volunteer their expertise as "science resource agents" one day a week for at least a year to give students in middle schools throughout Massachusetts and southern Maine hands-on experience with physics.

To refresh their background in physics and develop teaching methods before entering the classroom, these volunteers spent one day a week for 12 weeks attending a workshop focused on topics in the physical sciences ranging from sound and motion to optics. Through these workshops, they learn how to conduct about 200 inexpensive experiments and demonstrations that use everyday items.

LEARNING

THE BOSTON SUNDAY GLOBE • JUNE 19, 1994



GLOBE STAFF PHOTO / MICHAEL QUAN

Bill Anderson watches Mike Corcoran (left), Jill Cauldwell and James Sawyer work on an artesian diver demonstration.

RE-SEED is an outgrowth of Project SEED, for Science Education through Experiments and Demonstrations, which Northeastern started in 1990 to show middle-school science teachers how to conduct physics experiments and demonstrations instead of just lecturing from a textbook.

RE-SEED goes one step further in bringing retired scientists into the classroom.

"Most of these teachers aren't well-prepared to teach the physical sciences," and, as a result, they "are not confident about it," says Christos Zahopoulos, Project SEED's co-director. "It's easiest to learn the physical sciences by using concrete examples. We want to teach the students to think critically and learn how the basic concepts of physical

sciences apply to everyday life — build on concepts and problem solve, not just memorize facts.”

This program, funded by a National Science Foundation grant of \$888,000 for 1992-1996, is in high demand. Out of the 90 teachers who applied for it last year, only 25 were chosen, in part, on the basis of their potential leadership qualities.

“We want to train teachers who will in turn be able to train others,” Zahopoulos says. In all, these teachers represent more than 80 middle schools in Massachusetts.

The teachers participated in an intense four-week seminar during the summer, which covered much the same material as the seminar for the retired volunteers.

In addition, they visited such facilities as Raytheon, the Haystack Observatory, Mitre Corp. and Brayton Power Station, as well as the research laboratories at Northeastern University.

Each teacher received a \$1,200 stipend to attend the workshop, as well as a workbook detailing the experiments and materials to perform them.

The curriculum that the RE-SEED volunteers and SEED teachers have learned through these workshops has affected middle-school science classrooms in myriad ways. Some of the material has been integrated into a life science class, for example, or has changed the entire curriculum for a physical science class.

“The method we are using is applicable at any level,” says Zahopoulos. “We’re not advocating a particular curriculum. The program is designed to enhance any existing curriculum.”

For Dermot Shea, head of the science program in the Worcester Public Schools and who has taught the physical sciences in the middle schools for 29 years, Project SEED has been a lifesaver.

According to Shea, the school system has never recovered from the effects of the tax-limiting Proposition 2½, which went into effect in 1981. “Project SEED is positive energy in the midst of a negative situation,” Shea says, adding the program is getting teachers to look at science through reality rather than a textbook and getting the kids involved in learning.

“You can’t read a book and understand physics,” Shea says.

Although Shea, who received one of BASF Corp.’s four Teacher of the Year Awards this year, always has used a hands-on approach to teach-

ing science, Project SEED gave him the reassurance that he was doing the right thing and gave him new approaches to leading experiments.

For instance, he has helped students build a hydraulic jack using a big trash bag, some duct tape, straws and a wooden board.

Project SEED also has provided a way for Shea to share his ideas with other science teachers across the state. It has had a profound influence on other school systems as well.

After seeing its impact on David Lyons’ sixth-grade general science class at Garfield Community School in Revere last year, Wayne Lague, assistant superintendent of the Revere schools, decided to make science a critical area in the curriculum at all levels, starting in kindergarten.

“There are a lot of fads in education,” Lyons says. “But this program is the real thing, this nuts and bolts science information makes science teachers better.”

Lyons has used the SEED network extensively; he gets new ideas from his new colleagues every week.

“I’ve been hooked up with some of the best teachers in the area,” Lyons says. “You’d be amazed at the ideas they have.”

Deborah Reinemann, who teaches sixth-grade physical science at Coolidge Middle School in Reading, also has learned a great deal from her SEED colleagues. Before taking the SEED workshop, she had three ways to teach about pressure; now she has 15.

But these aren’t just entertaining experiments. Rosemary Hefle-Brandi, who teaches sixth- and eighth-grade science classes at Groton Dunstable Middle School in Groton, says Project SEED is “one of the best places” the National Science Foundation has invested its money.

Having taught a variety of subjects, even art, over the past 30 years, Brandi ought to know.

She says SEED makes it easy for students to build on concepts and treats math as a language, not just a computation skill, integrating it into each experiment.

“It’s a much clearer approach,” she says.

Brandi gets help from Bill Winowski, a RE-SEED volunteer, who, among other things, was an electrical engineer for the Patriot Missile program at Raytheon.

Brandi says she wouldn’t have time to do all the experiments Winowski brings to class. “He makes learning a game,” she says.

Just call these volunteers ‘science resource agents’



GLOBE STAFF PHOTO / MICHAEL QUAN

Bill Anderson handles a question on water pressure.

SEED also has helped Roseanne Gross, who teaches general science

in Grade 6 at Thomas A. Blake Middle School in Medfield.

Before Gross took the workshop, she didn’t have much confidence in teaching such subjects as buoyancy and density or working with the math. To get by, Gross relied heavily on a textbook and, on average, did only one experiment per week.

Now she’s doing as many as three a week, and she’s comfortable incorporating math and formulas into them. Her students, she says, “can’t get enough of science.”

In some cases, SEED has completely transformed a teacher’s style. The SEED manual has, for the most part, become Frank Woods’ curriculum for his eighth-grade physical sciences class at the Belmonte Middle School in Saugus.

“Doing experiments makes my teaching much more interactive,” Woods says. “My teaching is adjunct to the kids learning for themselves. I’m just there to help them along.”

For information about SEED or RE-SEED, call Northeastern University at (617) 373-5154.

**BOSTON
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Sowing seeds of science

Is there anything to do to fire the enthusiasm of more middle-school pupils for science? One approach is to bring in the experts, men and women who love science and who have done science, who can bring it alive.

Which is exactly what Northeastern University's Project Re-seed is doing. The 3-year-old program trains retired scientists to help out middle-school science teachers. It helps these volunteers learn how

to relate to kids while passing on their knowledge, insight and passion.

The program, paid for by a five-year National Science Foundation grant of \$888,000, has already trained more than 100 volunteers, many of whom now train others. They enlist for a year, but Re-seed's founder, Northeastern's Christos Zahopoulos, says most come back.

What a marvelous use of a tremendous human resource. We hope it spreads.



Craig F. Walker / Berkshire Eagle Staff

Katie Edwards watches the results of an experiment in which alcohol breaks down ink on a piece of paper.

The cool side of science

Retiree's demonstrations help make chemistry come alive for students

By Lynne A. Daley
Berkshire Eagle Staff

PITTSFIELD — The word "cool" may not count as a scientific observation, but the young chemists at Stearns School last week used it freely.

They learned to separate ink through paper chromatography, when alcohol caused ink on a strip of paper to break down.

"Cool," they marveled.

They watched as juice from a red cabbage indicated the presence of acidic and alkaline solutions, alternately turning blue and purple.

That, they pronounced, was "cool."

Retired biology teacher Charles Bunnell of Nessacus Middle School in Dalton had the class of 20 or so hanging on his every word as he explained the difference between compounds — when two or more things combine to form a

different things — and mixtures, which are combinations of things that may be easily separated again.

Bunnell, a representative of the RESEED — Retirees Enhancing Science Education through Experiments and Demonstrations — deftly mixed chemical terms and concepts with entertaining demonstrations and down-home facts.

Bunnell is just one of a group of re-

SCIENCE, continued on B4



Craig F. Walker / Berkshire Eagle Staff

Retired biology teacher Charles Bunnell adds vinegar to cabbage juice while explaining compounds and mixtures to students at Stearns School in Pittsfield Friday.

Retirees assist in science classes

■ SCIENCE, from B1

Retirees who visit schools around the county through the RESEED program, teaching science to youngsters and making it fun. It is a volunteer labor of love that takes him into schools nearly every day. RESEED is partially funded by the National Science Foundation.

"I love doing this," he said, packing up after Friday's 1½-hour demonstration.

Bunnell came to Martha Kirby's 4th-grade class laden down with supplies, including the aforementioned cabbage, salt, isopropyl alcohol, nails, magnets, strips of paper carefully marked with various inks, sand and jars. The supplies are all his, and he is careful to gather them all up again at the end of his demonstration.

But Bunnell downplays his own expense in the endeavor.

"I've spent a little money on this," he shrugged. "But that doesn't matter."

Bunnell also asked the students the various things that comprise our air — oxygen, carbon dioxide, nitrogen and water — and talked about how hydrogen and oxygen combine to form water. Hydrogen is so light, he told them, that it floats to the top of our 25-mile high atmosphere.

But he never digressed into lecture format, instead resorting to anecdotes — the Hindenburg disaster illustrated the dangerous

properties of hydrogen — and frequent questions of the class.

"They're actively involved," said teacher Kirby. "He's really stretching them, making them think. He's so excited, he gets them excited."

Kirby said Bunnell makes a special effort to draw girls into the fray, in response to studies that show how girls often are turned off from math and science early in their educational careers.

Kirby said she signed on to the program through Bunnell, who is her neighbor. Now, she is one of its biggest boosters.

RESEED volunteers receive training in teaching and presentation techniques. Then, they wait for schools to ask for their services.

As educational dollars are stretched more and more tightly, Bunnell and Kirby said, it only makes sense to take advantage of trained retirees willing to spend some time in the schools.

"We're hoping this will proliferate," he said. "We want more people to come forward to be trained."

The only problem, he said, is overcoming the reluctance of classroom teachers — many of whom aren't comfortable with science as a subject matter — at having strangers come in and take over their classes.

But, Kirby said, that's really no problem. In fact, she said, she was afraid that too much publicity might make it more difficult for her to book Bunnell for next year.

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THE INDUSTRY NEWSPAPER FOR ENGINEERS AND TECHNICAL MANAGEMENT

NSF PROGRAM TAPS EEs, SCIENTISTS AS VOLUNTEERS

Retirees get a big lift

BY ROBERT BELLINGER

Boston — Retired engineers and scientists are getting a big lift—literally—from a National Science Foundation (NSF) program that uses them as volunteers in middle-school science classrooms.

One favorite experiment that the retirees conduct is to have a student sit on a deflated garbage bag that is closed except for three or four straws in a corner of the bag. By blowing into the straws, the student is lifted several inches off the floor, demonstrating the principle of hydraulic presses.

Project Re-Seed (Retirees Enhancing Science Education through Experiments and Demonstrations) is a National Science Foundation-funded program that aims to give middle-school science teachers (grades six through nine) help with their classes.

"Studies have found that middle-school science teachers are the least prepared to teach physical sciences," said Project Re-Seed director Christos Zahopoulos. Often, "teachers do not make the connection between math and sciences." Retirees, fresh out of industry and trained in workshop sessions conducted at Northeastern University, plug the gap with demonstrations and experiments.

Most of the 83 current volunteers in the New England program are former engineers. Some corpo-

rations, such as Raytheon, have supported training for the retirees.

Zahopoulos said the engineers "get as much out of the program as the students." Some of them volunteer more than the one day a week required under the program. They must not only commit to volunteering at a middle-school class in their region every week but also must undergo a 12-session workshop that familiarizes them with 200 inexpensive, easy-to-conduct experiments and dem-

Project Re-Seed is an NSF-funded program that aims to give middle-school science teachers (grades six through nine) help with their classes.

onstrations—such as the garbage-bag example—that illustrate the principles of the physical sciences. While the engineers may know the principles, "they have to learn how to present the material to middle-school students," said Zahopoulos.

Not everyone is happy with the project.

John Densler, a Boston-based IEEE member, wrote a letter objecting to the program. "This is again the engineering schools attempting to recruit warm bodies."

Zahopoulos counters that "our society is becoming more sci-

ence-oriented. The more science people know, the better off they are. You don't have to be an engineer to appreciate science. This is not only for future engineers."

Besides, while there might be employment problems now, "who knows what it will be like by the time these students graduate?" he said.

Zahopoulos hopes the program goes national. Re-Seed, and a companion teacher training program called Project Seed, were funded with an NSF grant of \$888,000 that runs out in early 1996. The Noyce Foundation, set up by IC pioneer Robert Noyce, has contributed \$235,000 so far for a leadership program that trains volunteers to go back to their communities and train others.

Zahopoulos is looking for corporations that might want to take part in other regions of the country. One requirement is that there be some connection to the education community, because as a former AAES program, Engineers for Education, found out, the cooperation of teachers is necessary for any program's success.

Anyone interested in taking part in New England, or getting something started in their own region, can contact Christos Zahopoulos at Project Re-Seed, Northeastern University, 235 Forsyth Building, Boston, Mass., 02115, or call Deirdre Murphy at (617) 373-8388.

Middle School Science

Recent research has shown that American students are lagging behind students in many other parts of the world in science and mathematics. The middle school years are often the time when students lose interest in these subjects. It is critical, however, to keep students engaged in science and mathematics, particularly since the principles and concepts they learn in middle school form the foundation on which their future academic careers are built. People with science backgrounds can help middle school students understand how science and mathematics are connected to the real world and they can demonstrate that careers in these fields can be exciting and rewarding.



PROJECT RESEED
Northeastern University, 378 Columbus Place, Boston, MA 02115

You Can Make A Difference in a Middle School Student's Education

PROJECT RE-SEED

RETIREES ENHANCING SCIENCE

EDUCATION THROUGH EXPERIMENTS

AND DEMONSTRATIONS

Project RE-SEED

RE-SEED is a Northeastern University program that is supported by a grant from the Noyce Foundation. In this program, volunteers with science backgrounds assist middle school science teachers with activities that demonstrate the basic principles of physical science. The program began in 1991 with six volunteers. There are now over 180 volunteers in four states. Although most of the volunteers are retirees, the program is open to qualified working people who can commit to volunteering one day a week during the school day.

Volunteering

Many teachers who have worked with RE-SEED volunteers—or Science Resource Agents (SRAs)—have told us that the SRAs have made a significant difference in the attitudes that students have about science and mathematics. One student wrote this about the SRA who volunteered in his science class:

"Mr. Anderson's experiments are educational and fun to learn about. So far we've learned about acceleration, magnetism, and electricity. In a book, learning about that would be boring, but with Mr. Anderson and his neat experiments, it becomes a lot of fun."

Training

SRAs go through a free comprehensive training program before they begin volunteering. They attend twelve workshop sessions where they learn many hands-on activities that demonstrate the principles behind the following topics: length, time, and mass; area, volume, and force; density and buoyancy; pressure; simple machines; motion; earth as a planet; elements and compounds; sound; optics; electricity; and magnetism. Participants receive a kit of science materials and a sourcebook with over 200 hands-on activities that are appropriate for middle school students and can be done with inexpensive materials. Training

programs will be held in the fall of 1995 in the following communities:

- * Barnstable, MA
- * Lowell, MA
- * Marshfield, MA
- * Pittsfield, MA
- * Reading, MA
- * Springfield, MA
- * Worcester, MA
- * Brunswick, ME
- * Gorham, ME
- * Kennebunk, ME
- * Nashua, NH
- * Portsmouth, NH
- * Providence, RI

For more information or to register for a training program, please call 617-373-8388.